

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method for generating at least one sequence of random numbers of 1/f noise by a computer system, which comprises the steps of:

determining a desired spectral value  $\beta$ ;

determining a number of the random numbers of the 1/f noise to be generated;

determining an intensity constant const;

setting a starting value for a running variable n;

performing a loop-type repetition until a desired number of elements  $y(n)$  of a vector  $y$  of length n is calculated from 1/f-distributed random numbers, by the steps of:

increasing a current value of the running variable n by 1;

setting a simulation time step  $[t_{n-1}; t_n]$ ;

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determining elements  $\underline{C}_{ij}$  of a covariance matrix  $\underline{C}$  of dimension  $(n \times n)$  according to:

$$\underline{C}_{ij} := \text{const} \cdot \left( -|t_j - t_i|^{\beta+1} + |t_{j-1} - t_i|^{\beta+1} + |t_j - t_{i-1}|^{\beta+1} - |t_{j-1} - t_{i-1}|^{\beta+1} \right) \\ i, j = 1, \dots, n$$

determining an inverted covariance matrix  $\underline{C}^{-1}$  by inverting the covariance matrix  $\underline{C}$ ;

determining a variable  $\sigma$  in accordance with

$$\sigma = \text{sqrt}(1 / e(n, n)),$$

where sqrt denotes a square root function, and  $e(n, n)$  denotes an element of the inverted covariance matrix  $\underline{C}^{-1}$  indexed by  $(n, n)$ ;

determining a  $(0,1)$ -normally distributed random number which forms an  $n$ th component of a vector  $\underline{x}$  of length  $n$ ;

forming a variable  $\mu$  from first  $(n-1)$  components of an  $n$ th row of the inverted covariance matrix  $\underline{C}^{-1}$  and  $(n-1)$  elements of the vector  $\underline{y}$  calculated for a preceding  $(n-1)$  simulation time step, according to:

$$\mu := - \frac{y_{(n-1)}^T \cdot \underline{C}_{\underline{n}, n}^{-1}}{\underline{C}_{\underline{n}, n}^{-1}}$$

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where  $y_{(n-1)}$  denotes first  $(n-1)$  elements of the vector  $y$ ,

$\underline{C}_{:,n}^{-1}$  denotes the first  $(n-1)$  components of the  $n$ th row of

the inverted covariance matrix  $\underline{C}^{-1}$ , and  $\underline{C}_{n,n}^{-1}$  denotes a

component of the inverted covariance matrix  $\underline{C}^{-1}$  indexed by

$(n,n)$ ; and

calculating an element  $y(n)$  of the vector  $y$  of length  $n$

from the  $1/f$ -distributed random numbers, according to:

$$y(n) = x(n) * \sigma + \mu;$$

storing and outputting the at least one sequence of random numbers of  $1/f$  noise.

Claim 2 (currently amended): A method for generating at least one sequence of random numbers of  $1/f$  noise by a computer system, which comprises the steps of:

determining a desired spectral value  $\beta$ ;

determining a number of the random numbers of the  $1/f$  noise to be generated;

determining an intensity constant  $\text{const}$ ;

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setting a starting value for a running variable  $n$ ;

calculating  $q$  sequences of the random numbers of the  $1/f$  noise simultaneously, by performing loop-type repetitions until a desired number of elements  $y_{k,n}$  of a vector  $y$  of length  $n$  is calculated from  $1/f$ -distributed random numbers, by the steps of:

increasing a current value of the running variable  $n$  by 1;

setting a simulation time step  $[t_{n-1}; t_n]$ ;

determining elements  $\underline{C}_{ij}$  of a covariance matrix  $\underline{C}$  of dimension  $(n \times n)$  according to:

$$\underline{C}_{ij} := \text{const} \cdot \left( -|t_j - t_i|^{\beta+1} + |t_{j-1} - t_i|^{\beta+1} + |t_j - t_{i-1}|^{\beta+1} - |t_{j-1} - t_{i-1}|^{\beta+1} \right) \\ i, j = 1, \dots, n$$

determining an inverted covariance matrix  $\underline{C}^{-1}$  by inverting the covariance matrix  $\underline{C}$ ;

determining a variable  $\sigma$  in accordance with

$$\sigma = \text{sqrt}(1 / e(n, n)),$$

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where  $\text{sqrt}$  denotes a square root function, and  $e(n,n)$  denotes an element of the inverted covariance matrix  $\underline{C}^{-1}$  indexed by  $(n,n)$ ;

determining a quantity  $q$  of  $(0,1)$ -normally distributed random numbers  $x_{k,n}$  which form a respective last component of vectors  $\underline{x}_k$  of length  $n$ , where  $k = 1, \dots, q$ ,

forming  $q$  variables  $\mu_k$  according to:

$$\mu_k := -\frac{y_{(n-1),k}^T \cdot \underline{C}_{*,n}^{-1}}{\underline{C}_{n,n}^{-1}}$$

where  $y_{(n-1),k}$  denotes first  $(n-1)$  components of the vectors  $\underline{y}_k$  that were calculated for a preceding simulation time step,  $\underline{C}_{*,n}^{-1}$  denotes the first  $(n-1)$  components of the  $n$ th row of the inverted covariance matrix  $\underline{C}^{-1}$ , and  $\underline{C}_{n,n}^{-1}$  denotes the element of the inverted covariance matrix  $\underline{C}^{-1}$  indexed by  $(n,n)$ , where  $k = 1, \dots, q$ ; and

calculating  $q$  elements  $y_{k,n}$  which form a respective  $n$ th component of the vector  $\underline{y}_k$  of length  $n$  from  $1/f$ -distributed random numbers, according to:

$$y_{k,n} = x_{k,n} * \sigma + \mu_k,$$

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where  $k = 1, \dots, q$ ;

storing and outputting at least one of the  $q$  sequences of random numbers of  $1/f$  noise.

Claim 3 (original): A method for simulating a technical system subject to  $1/f$  noise, which comprises the steps of:

determining random numbers according to claim 1; and

using the random numbers for modeling variables present on input channels of the technical system.

Claim 4 (original): A method for simulating a technical system subject to  $1/f$  noise, which comprises the steps of:

determining random numbers according to claim 2; and

using the random numbers for modeling variables present on input channels of the technical system.

Claim 5 (original): A computer program, comprising:

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computer-executable instructions for carrying out the method according to claim 1 for determining the sequences of random numbers of the 1/f noise.

Claim 6 (original): A computer program, comprising:

computer-executable instructions for carrying out the method according to claim 2 for determining the sequences of random numbers of the 1/f noise.

Claim 7 (original): A computer-readable data medium having the computer-executable instructions according to claim 5.

Claim 8 (original): A computer-readable data medium having the computer-executable instructions according to claim 6.

Claim 9 (original): A downloading method, which comprises the step of:

downloading the computer program according to claim 5 from an electronic data network onto a computer connected to the electronic data network.

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Claim 10 (currently amended): The method according to claim  
[[10]]9, which further comprises using the Internet as the  
electronic data network.

Claim 11 (original): A downloading method, which comprises  
the step of:

downloading the computer program according to claim 6 from an  
electronic data network onto a computer connected to the  
electronic data network.

Claim 12 (original): The method according to claim 11, which  
further comprises using the Internet as the electronic data  
network.

Claim 13 (previously presented): A computer system,  
comprising:

processor programmed for executing the method for determining  
the sequences of random numbers of the 1/f noise according to  
claim 1.

Claim 14 (previously presented): A computer system,  
comprising:



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processor programmed for executing the method for determining the sequences of random numbers of the 1/f noise according to claim 2.

Claim 15 (previously presented): A computer system, comprising:

processor programmed for executing the method for determining the sequences of random numbers of the 1/f noise according to claim 3.

Claim 16 (previously presented): A computer system, comprising:

processor programmed for executing the method for determining the sequences of random numbers of the 1/f noise according to claim 4.

Claim 17 (currently amended): A method for simulating a technical system subject to 1/f noise, which comprises the steps of:

determining random numbers according to claim 1; and

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using the random numbers for fixing variables present on input  
channels of the technical system; and

simulating the technical system and outputting the result of  
the simulation.

Claim 18 (currently amended): A method for simulating a  
technical system subject to 1/f noise, which comprises the  
steps of:

determining random numbers according to claim 2; and

using the random numbers for fixing variables present on input  
channels of the technical system; and

simulating the technical system and outputting the result of  
the simulation.